



NATIONAL AERONAUTICS AND SPACE ADMINISTRATION  
WASHINGTON, D.C. 20546

MARSHAL L



REPLY TO  
ATTN OF: GP

JAN 2 1980

TO: NST-44  
~~KSC~~/Scientific & Technical Information Division  
Attn: Miss Winnie M. Morgan

FROM: GP/Office of Assistant General  
Counsel for Patent Matters

SUBJECT: Announcement of NASA-Owned U.S. Patents in STAR

In accordance with the procedures agreed upon by Code GP and Code KSI, the attached NASA-owned U.S. Patent is being forwarded for abstracting and announcement in NASA STAR.

The following information is provided:

U.S. Patent No. : 4,040,940

Government or  
Corporate Employee : U.S. Gov't.

Supplementary Corporate  
Source (if applicable) : \_\_\_\_\_

NASA Patent Case No. : MFS-23,284-1

NOTE - If this patent covers an invention made by a corporate employee of a NASA Contractor, the following is applicable:

YES ☐

NO ☒

Pursuant to Section 305(a) of the National Aeronautics and Space Act, the name of the Administrator of NASA appears on the first page of the patent; however, the name of the actual inventor (author) appears at the heading of column No. 1 of the Specification, following the words "...with respect to an invention of ..."

*Bonnie L. Henderson*

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Enclosure

(NASA-Case-MFS-23284-1) ELECTROPHORETIC  
FRACTIONAL ELUTION APPARATUS EMPLOYING A  
ROTATIONAL SEAL-FRACTION COLLECTOR Patent  
(NASA) 12 p CSCL 13I

N80-14397

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Unclas

## United States Patent [19]

[11] 4,040,940

Bier

[45] Aug. 9, 1977

[54] **ELECTROPHORETIC FRACTIONAL ELUTION APPARATUS EMPLOYING A ROTATIONAL SEAL FRACTION COLLECTOR**

[75] Inventor: Milan Bier, Tucson, Ariz.

[73] Assignee: The United States of America as represented by the Secretary of the Department of Health, Education and Welfare, Washington, D.C.

[21] Appl. No.: 753,103

[22] Filed: Dec. 21, 1976

[51] Int. Cl.<sup>2</sup> ..... G01N 27/26; G01N 27/28

[52] U.S. Cl. .... 204/299 R; 204/180 G

[58] Field of Search ..... 204/180 S, 180 R, 180 G, 204/299, 300, 304; 233/11

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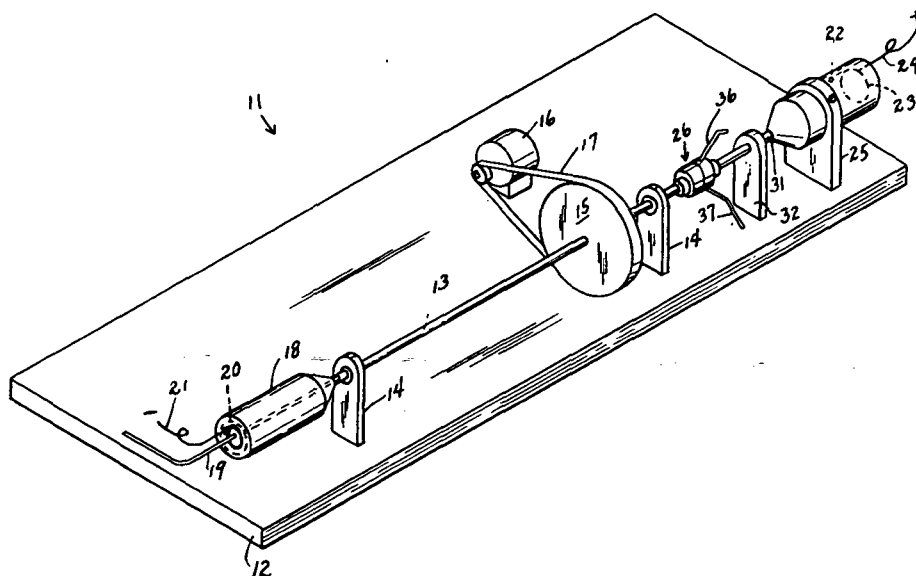
Primary Examiner—Arthur C. Prescott  
Attorney, Agent, or Firm—Browdy and Neimark

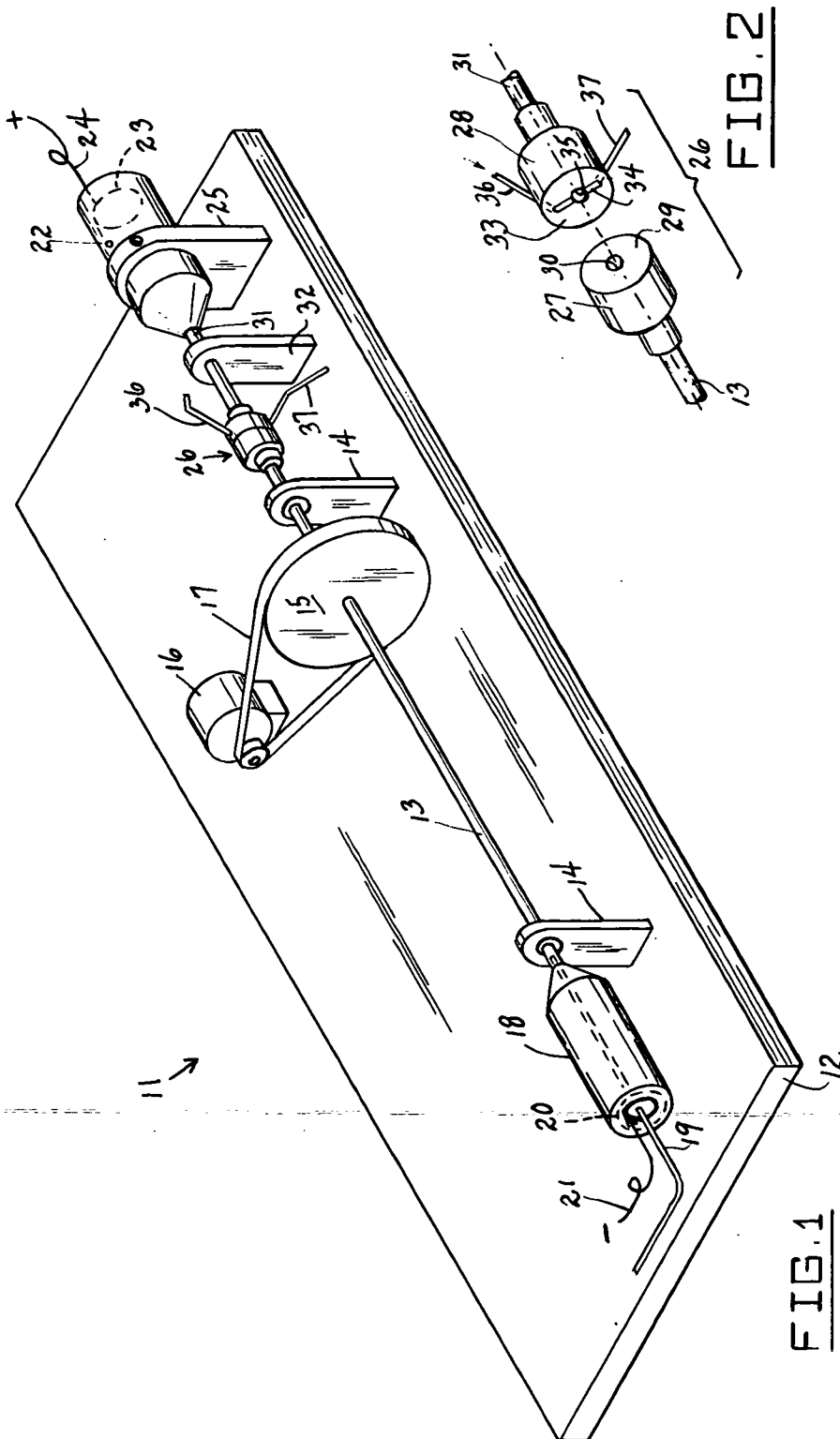
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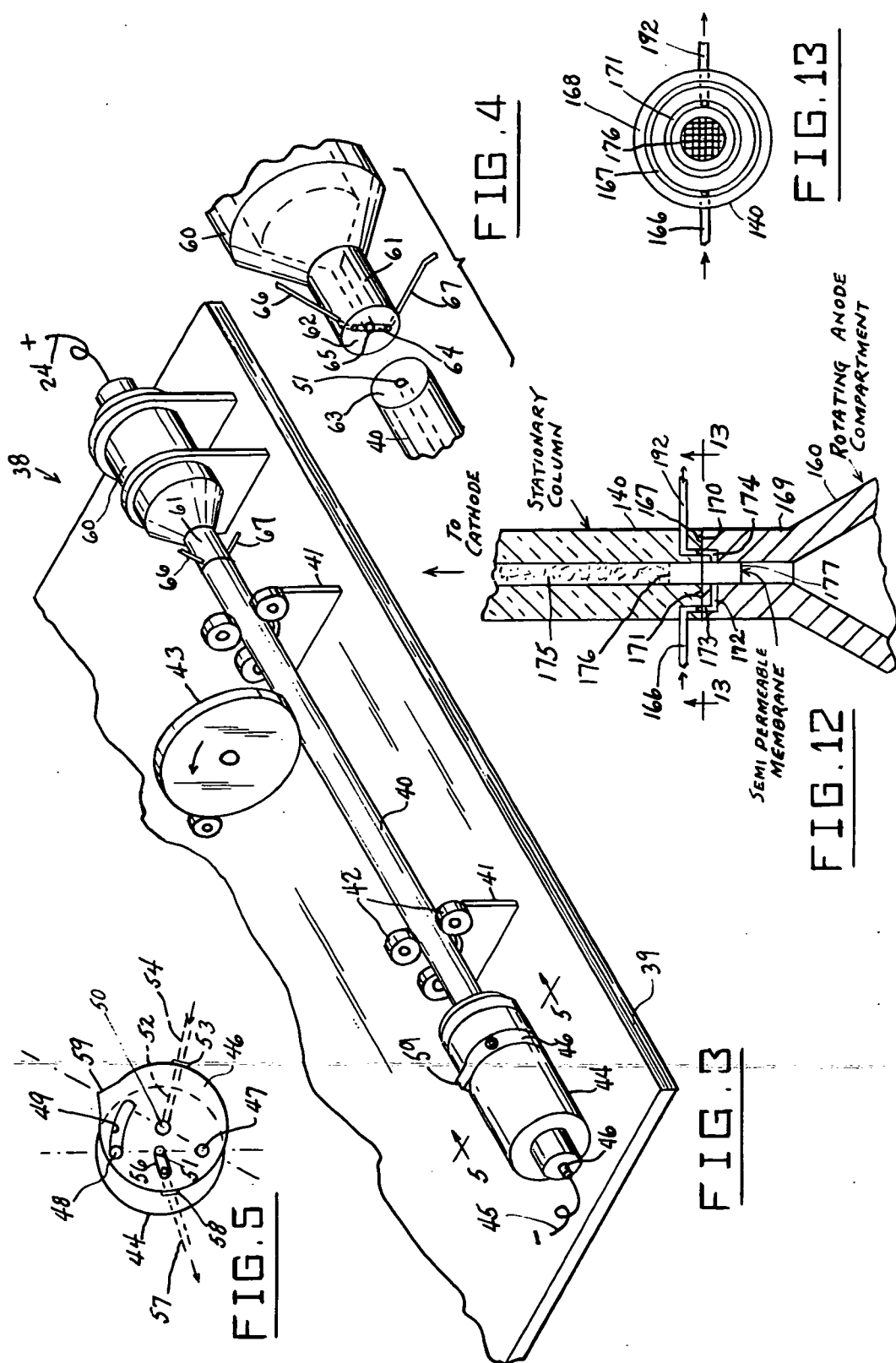
## ABSTRACT

Electrophoretic fractional elution apparatus has a column with a rotating seal joint at which a thin jet of eluting buffer is directed across the lumen of the electrophoretic column in a direction perpendicular to that of electrophoretic migration. Either the content of the column is rotated with respect to the stationary jet, or the jet is rotated with respect to the column. The system may employ electrophoresis either in free solution or in packed columns.

12 Claims, 13 Drawing Figures







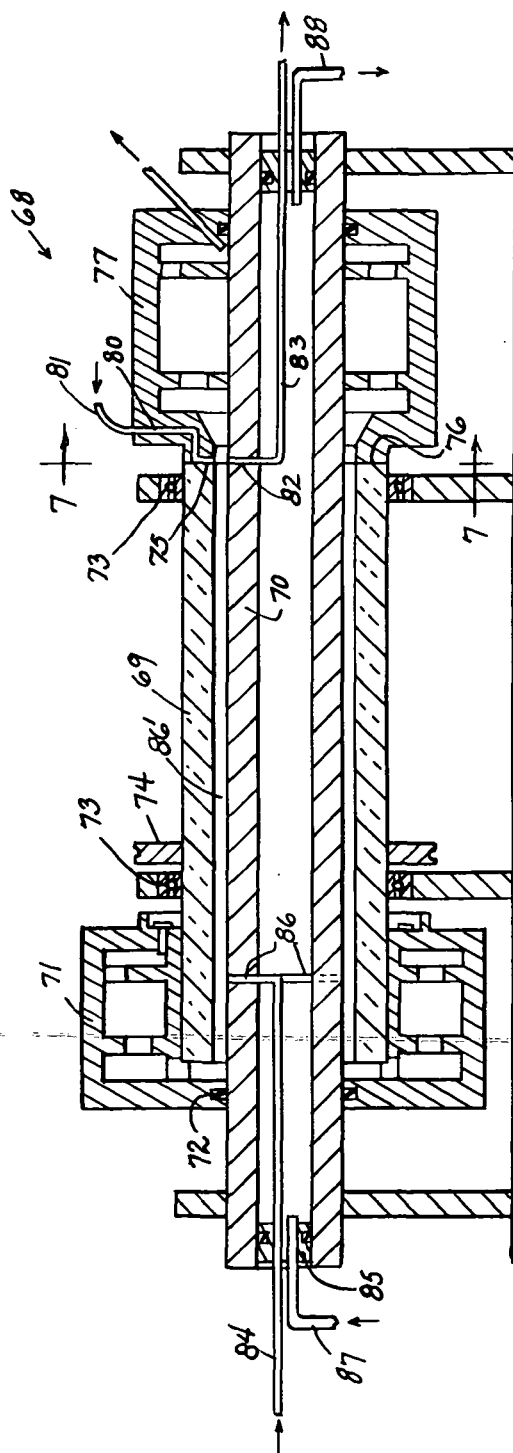


FIG. 6

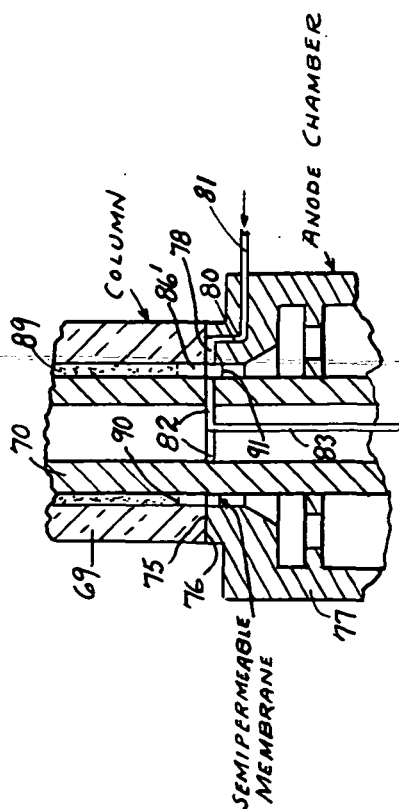


FIG. 8

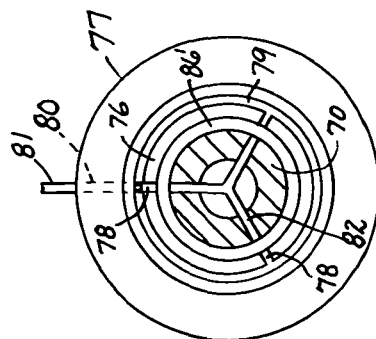


FIG. 7

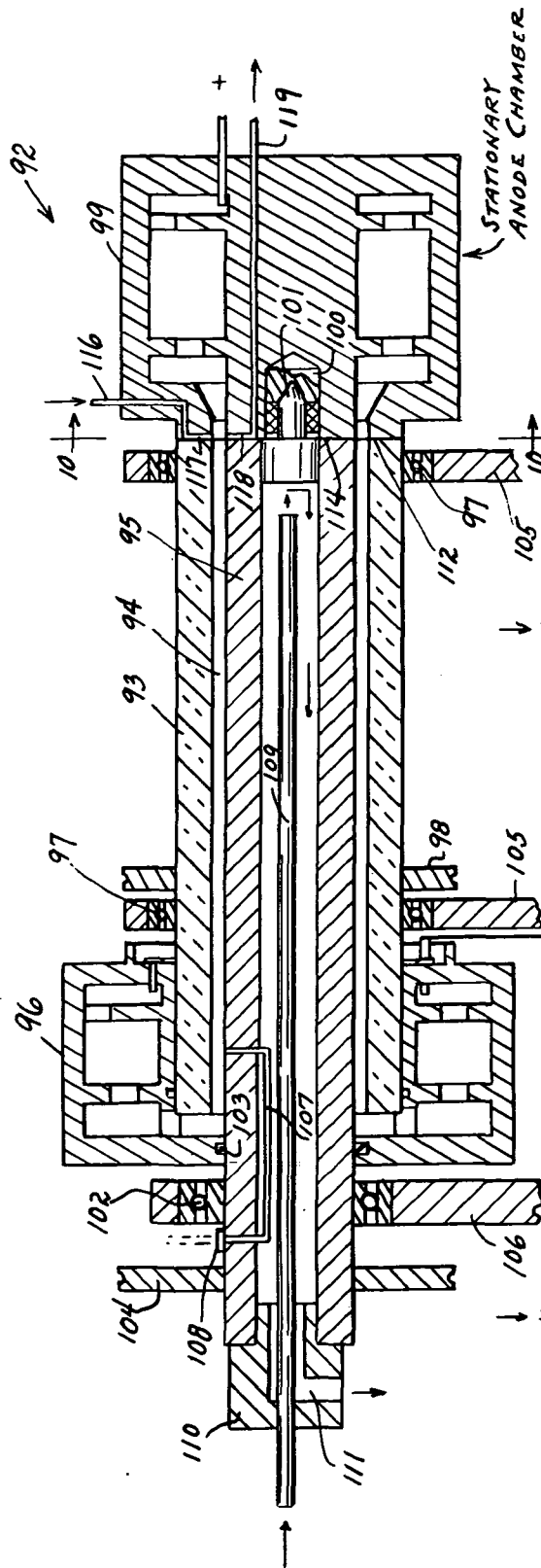


FIG. 9

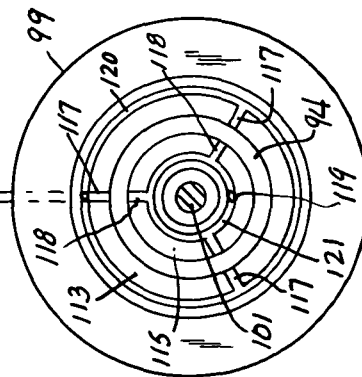


FIG. 10

FIG. 11

part and said rotatable electrode compartment associated with said rotating seal fraction collector.

4. The elution apparatus of claim 1, and wherein said electrophoresis column comprises two concentric cylinders and wherein said registering lumens comprise the space between the cylinders, and wherein said means for directing the jet of eluting buffer is arranged to cause the jet to radially traverse the fluid contained within said lumens substantially at the interface defined by said mated surfaces.

5. The elution apparatus of claim 4, and wherein said concentric cylinders are horizontally mounted and are provided with means to independently rotate the cylinders around their axes, and wherein a rotating electrode compartment is provided, attached to an end of one of the cylinders, and means to introduce a sample into the lumen inside said one cylinder in close proximity to said rotating electrode compartment, and wherein a stationary electrode compartment is provided adjacent to the other end of said one cylinder, said mated flat surfaces being at the interface between said concentric cylinders and said stationary electrode compartment.

6. The elution apparatus of claim 4, and wherein said concentric cylinders are vertically mounted, and lumen between the cylinders containing anti-convective material, and wherein a first electrode compartment is provided at one end of the cylinders, and wherein a second electrode compartment is provided adjacent the other end of the cylinders, said mated flat surfaces being at the interface between the concentric cylinders and one of the electrode compartments.

7. The elution apparatus of claim 1, and wherein said electrophoresis column is provided with a semi-permeable membrane in the path of electrophoretic migration and located on the anodic side of the interface formed by said mated surfaces.

8. The elution apparatus of claim 7, and wherein said semi-permeable membrane is located between 0.1 and 0.3 cm. away from said interface.

9. The elution apparatus of claim 1, and wherein said electrophoresis column has a stationary part and a rotating part located on opposite sides of said interface, respective electrode compartments attached to the ends of said stationary and rotating column parts, and means to introduce a sample into the column at a location spaced a substantial distance along the column from said interface.

10. The elution apparatus of claim 9, and wherein said electrophoresis column is horizontally positioned and wherein said sample-introducing means is located adjacent to one of the electrode compartments.

11. The elution apparatus of claim 1, and wherein said electrophoresis column is vertically positioned and has a stationary part and a rotating part at opposite sides of said interface, said column parts being provided at their ends with respective electrode compartments, one being cathodic and the other anodic.

12. The elution apparatus of claim 11, and wherein one column part contains anti-convective material and the other column part is provided with a semi-permeable membrane and is attached to the anodic electrode compartment.

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